

III. Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1-31. (Canceled)

Claim 32 (Previously presented): An interconnect structure comprising:
an insulating layer over a semiconductor structure having an opening therein;
a fill layer comprised of Cu and Ti filling said opening in said insulating layer; and
a self-passivation layer comprised titanium nitride over said fill layer.

Claim 33 (Previously presented): The structure according to Claim 32 further comprising a barrier layer over said insulating layer and underlying said fill layer.

Claim 34 (Previously presented): The structure according to Claim 32 wherein said insulating layer is comprised of a low-k material.

Claim 35 (Previously presented): The structure according to Claim 32 wherein said self-passivation layer is comprised of oxygen-rich titanium nitride.

Claim 36 (Previously presented): The structure according to Claim 32 wherein said opening is a dual damascene shaped opening.

Claim 37 (Previously presented): The structure according to Claim 33 wherein said barrier layer comprises TaN.

Claim 38 (Currently amended): The structure according to Claim 33 wherein said barrier layer is comprised of tantalum nitride, molybdenum, tungsten, chromium, or vanadium ~~and wherein said barrier layer has a thickness of between about 50 and 2000 Angstroms.~~

Claim 39 (Previously presented): The structure according to Claim 33 wherein said barrier layer has a thickness of between about 50 and 2000 Angstroms.

Claim 40 (Previously presented): The structure according to Claim 32 wherein said Ti is essentially uniformly distributed through said fill layer.

Claim 41 (Currently amended): An interconnect structure comprising:
an insulating layer over a semiconductor structure having an opening therein;
a barrier layer over said insulating layer conformally within said opening;
a fill layer comprised of Cu and Ti filling said opening in said insulating layer and overlying said barrier layer wherein the fill layer has a Ti concentration ranging between about 0.1 and 2.0 weight %; and
a self-passivation layer comprised titanium nitride over said fill layer.

Claim 42 (Previously presented): The structure according to Claim 41 wherein said insulating layer is comprised of a low-k material.

Claim 43 (Previously presented): The structure according to Claim 41 wherein said self-passivation layer is comprised of oxygen-rich titanium nitride.

Claim 44 (Previously presented): The structure according to Claim 41 wherein said opening is a dual damascene shaped opening.

Claim 45 (Previously presented): The structure according to Claim 41 wherein said barrier layer comprises TaN.

Claim 46 (Currently amended): The structure according to Claim 41 wherein said barrier layer is comprised of tantalum nitride, molybdenum, tungsten, chromium, or vanadium-and-
~~wherein said barrier layer has a thickness of between about 50 and 2000 Angstroms.~~

Claim 47 (Previously presented): The structure according to Claim 41 wherein said barrier layer has a thickness of between about 50 and 2000 Angstroms.

Claim 48 (Previously presented): The structure according to Claim 41 wherein said Ti is essentially uniformly distributed through said fill layer.

Claim 49 (Previously presented): An interconnect structure comprising:
an insulating layer over a semiconductor structure having an opening therein;
a fill layer comprised of Cu and Ti filling said opening in said insulating layer wherein said Ti is essentially uniformly distributed through said fill layer; and
a self-passivation layer comprised titanium nitride over said fill layer.

Claim 50 (Previously presented): The structure according to Claim 49 further comprising a barrier layer over said insulating layer and underlying said fill layer.

Claim 51 (Previously presented): The structure according to Claim 49 wherein said insulating layer is comprised of a low-k material.

Claim 52 (Previously presented): The structure according to Claim 49 wherein said self-passivation layer is comprised of oxygen-rich titanium nitride.

Claim 53 (Previously presented): The structure according to Claim 49 wherein said opening is a dual damascene shaped opening.

Claim 54 (Previously presented): The structure according to Claim 50 wherein said barrier layer comprises TaN.

Claim 55 (Currently amended): The structure according to Claim 50 wherein said barrier layer is comprised of tantalum nitride, molybdenum, tungsten, chromium, or vanadium ~~and wherein said barrier layer has a thickness of between about 50 and 2000 Angstroms.~~

Claim 56 (Previously presented): The structure according to Claim 50 wherein said barrier layer has a thickness of between about 50 and 2000 Angstroms.

Claim 57 (New): The structure according to Claim 32 wherein said fill layer has a Ti concentration ranging between about 0.1 and 2.0 weight %.

Claim 58 (New): An interconnect structure comprising:

an insulating layer over a semiconductor structure having an opening therein;

a fill layer comprised of Cu and Ti filling said opening in said insulating layer wherein said Ti concentration ranges between about 0.1 and 2.0 weight %; and

a self-passivation layer comprised titanium nitride over said fill layer.

Claim 59 (New): The structure according to Claim 58 wherein Ti is essentially uniformly distributed through said fill layer.

Claim 60 (New): The structure according to Claim 58 wherein said insulating layer is comprised of a low-k material.

Claim 61 (New): The structure according to Claim 58 wherein said opening is a dual damascene shaped opening.

Claim 62 (New): The structure according to Claim 58 further comprising a barrier layer disposed between the insulating layer and the fill layer.